

Title (en)  
NEURAL NETWORK PROCESSING ELEMENT INCORPORATING COMPUTE AND LOCAL MEMORY ELEMENTS

Title (de)  
VERARBEITUNGSELEMENT EINES NEURONALEN NETZWERKS MIT RECHEN- UND LOKALEN SPEICHERELEMENTEN

Title (fr)  
ÉLÉMENT DE TRAITEMENT DE RÉSEAU NEURONAL AUQUEL SONT INTÉGRÉS DES ÉLÉMENTS DE MÉMOIRE LOCALE ET DE CALCUL

Publication  
**EP 3607500 B1 20231220 (EN)**

Application  
**EP 18781080 A 20180403**

Priority  
• US 201762481492 P 20170404  
• US 201762531372 P 20170712  
• IL 2018050396 W 20180403

Abstract (en)  
[origin: US2018285254A1] A novel and useful system and method of accessing multi-dimensional data in memory. The invention is applicable to neural network (NN) processing engines adapted to implement artificial neural networks (ANNs). The NN processor is constructed from self-contained computational units organized in a hierarchical architecture. The homogeneity enables simpler management and control of similar computational units, aggregated in multiple levels of hierarchy. Computational units are designed with minimal overhead as possible, where additional features and capabilities are aggregated at higher levels in the hierarchy. On-chip memory provides storage for content inherently required for basic operation at a particular hierarchy and is coupled with the computational resources in an optimal ratio. Lean control provides just enough signaling to manage only the operations required at a particular hierarchical level. Dynamic resource assignment agility is provided which can be adjusted as required depending on resource availability and capacity of the device.

IPC 8 full level  
**G06F 12/02** (2006.01); **G06F 12/06** (2006.01); **G06F 13/16** (2006.01); **G06N 3/04** (2023.01); **G06N 3/063** (2023.01); **G06N 3/08** (2023.01)

CPC (source: EP US)  
**G06F 5/01** (2013.01 - US); **G06F 7/501** (2013.01 - US); **G06F 7/523** (2013.01 - US); **G06F 9/30054** (2013.01 - US); **G06F 9/5016** (2013.01 - US); **G06F 9/5027** (2013.01 - US); **G06F 12/02** (2013.01 - US); **G06F 12/0207** (2013.01 - EP US); **G06F 12/0646** (2013.01 - EP US); **G06F 12/0692** (2013.01 - EP US); **G06F 13/1663** (2013.01 - EP US); **G06F 17/110** (2013.01 - US); **G06F 30/27** (2020.01 - US); **G06F 30/30** (2020.01 - US); **G06N 3/02** (2013.01 - US); **G06N 3/04** (2013.01 - US); **G06N 3/045** (2023.01 - EP US); **G06N 3/063** (2013.01 - EP US); **G06N 3/08** (2013.01 - US); **G06N 3/084** (2013.01 - EP US); **G06N 20/00** (2019.01 - US); **G06N 3/082** (2013.01 - EP US); **Y02D 10/00** (2018.01 - US)

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**US 11461615 B2 20221004; US 2018285254 A1 20181004**; CN 110462640 A 20191115; CN 110462640 B 20230707; CN 110462642 A 20191115; CN 110462642 B 20230808; CN 110462643 A 20191115; CN 110476174 A 20191119; CN 110476174 B 20230623; CN 110494869 A 20191122; CN 110494869 B 20230804; EP 3607497 A1 20200212; EP 3607497 A4 20200408; EP 3607497 B1 20231220; EP 3607498 A1 20200212; EP 3607498 A4 20200408; EP 3607498 B1 20240508; EP 3607499 A1 20200212; EP 3607499 A4 20200408; EP 3607499 B1 20231213; EP 3607500 A1 20200212; EP 3607500 A4 20200520; EP 3607500 B1 20231220; EP 3607501 A1 20200212; EP 3607501 A4 20200408; JP 2020515989 A 20200528; JP 2020515990 A 20200528; JP 2020515991 A 20200528; JP 2020517005 A 20200611; JP 2020517006 A 20200611; JP 7108268 B2 20220728; JP 7148087 B2 20221005; JP 7170281 B2 20221114; JP 7191329 B2 20221219; JP 7288250 B2 20230607; US 10387298 B2 20190820; US 11216717 B2 20220104; US 11238331 B2 20220201; US 11263512 B2 20220301; US 11354563 B2 20220607; US 11461614 B2 20221004; US 11514291 B2 20221129; US 11675693 B2 20230613; US 2018285678 A1 20181004; US 2018285718 A1 20181004; US 2018285719 A1 20181004; US 2018285725 A1 20181004; US 2018285726 A1 20181004; US 2018285727 A1 20181004; US 2018285735 A1 20181004; US 2018285736 A1 20181004; WO 2018185762 A1 20181011; WO 2018185763 A1 20181011; WO 2018185764 A1 20181011; WO 2018185765 A1 20181011; WO 2018185766 A1 20181011

DOCDB simple family (application)  
**US 201815943992 A 20180403**; CN 201880020722 A 20180403; CN 201880021600 A 20180403; CN 201880021608 A 20180403; CN 201880022145 A 20180403; CN 201880022239 A 20180403; EP 18780640 A 20180403; EP 18780642 A 20180403; EP 18781080 A 20180403; EP 18781193 A 20180403; EP 18781194 A 20180403; IL 2018050392 W 20180403; IL 2018050393 W 20180403; IL 2018050394 W 20180403; IL 2018050395 W 20180403; IL 2018050396 W 20180403; JP 2019554805 A 20180403; JP 2019554894 A 20180403; JP 2019554909 A 20180403; JP 2019555007 A 20180403; JP 2019555011 A 20180403; US 201715669933 A 20170806; US 201715794586 A 20171026; US 201715838552 A 20171212; US 201815943800 A 20180403; US 201815943830 A 20180403; US 201815943845 A 20180403; US 201815943872 A 20180403; US 201815943976 A 20180403